

2017 YEAR IN REVIEW



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UI LABS is where innovators go to plot the future. In 2017, the ingenuity and collaborative spirit of our partners were on full display. We overhauled the manufacturing floor at our Innovation Center with a combination of equipment and assets found nowhere else in North America. We onboarded incredible new talent to our team. We published world-leading research on the transformation taking place in the manufacturing workforce. We joined forces with civic engagement experts to better integrate resident input into our smart city products. Through it all, we honed our model and set an aggressive cadence of workshops and events to engage an evolving set of stakeholders as we take on the toughest challenges facing our factories and communities.

While we continue to set our eyes forward, the year's breakthroughs and accomplishments are worth pausing to celebrate. The momentum has continued into 2018 as we use our unique capabilities to drive the digital future of manufacturing and cities. Onward!

Caralynn Collens
Chief Executive Officer, UI LABS

Warren Holtsberg
Chairman, UI LABS Board of Directors

UI LABS in action

The UI LABS project portfolio is maturing as projects move toward completion and transition to market. We are using our ability to curate cross-sector teams to address problems that require a variety of perspectives, for example: smart mobility, standards for emerging technologies, integration of new and old equipment on the shop floor. Here are some highlights.



CITY TECH PROJECT HIGHLIGHTS

CTA Night Games Alert Program

CTA Night Games Alert Program. City Tech partnered with the CTA, Mastercard, Syniverse, and ideas42 to [launch a pilot](#) testing the ability to change traveler behavior with economic incentives. The mission of the pilot was to reduce congestion and improve a riders' experience during Chicago Cubs games. Over 2,000 CTA riders signed up to participate in the CTA Night Games Alert Program, which ran from August 28th to October 19th. Four types of messages were sent on days with Cubs home games during the pilot: informational, instructional, fare rebates, and donations. Fare rebates had the most impact with average participant ridership [dropping nearly 18 percent](#) among eligible riders.

Smart Green Infrastructure Monitoring

Starting off 2017, City Tech completed the installation of sensors, as part of the [Smart Green Infrastructure Monitoring \(SGIM\)](#) pilot, at the [Argyle “shared street”](#) in Uptown and Langley Avenue in Roseland. With the addition of these installations, sensors were placed at four green infrastructure sites across Chicago and measured performance of different green infrastructure – permeable pavement, bioswale, infiltration planters, and tree pit filters – to better understand and compare performance of each. The sensors captured data points such as soil moisture, air temperature, rainfall, pressure, wind speed, and other weather-related information. Data from the SGIM pilot can be accessed through the [Chicago Open Data Portal](#).



DMDII PROJECT HIGHLIGHTS

Improving Welding in Real Time

Welding is an essential method for joining parts even in a digital age, and the typical quality control process is to inspect each part after it's complete. A DMDII project involving the University of Illinois at Chicago, Illinois Tool Works, and Industrial Measurement Systems (a small R&D firm located in Aurora, Illinois) uses sensors and artificial intelligence to improve each weld in real time. Not only does this avoid mistakes, it enables the welding process to learn from itself and get better as it goes. This has implications for industries like aerospace, automotive, energy, and shipbuilding – allowing them to avoid waste and scrap and continually improve their operations.



Using Cameras to Get Digital Info from Legacy Machines

Even on the most modern of shop floors, there are often aging machines that remain in use because they serve a niche purpose, or the cost of replacing them is prohibitive. This equipment is often unmonitored because there is no way to get information from it in an automated way. This project is using off-the-shelf cameras and analytics software to read the dials on these legacy machines and collect the information needed to improve maintenance, safety, and productivity. It also gets these machines integrated into system-wide monitoring and optimization strategies where they exist. On a larger scale, this solution can leverage investments in manufacturing equipment made decades ago by making these machines responsive to digital technologies, helping to make up for a lack of investment in domestic manufacturing capability and capital equipment in more recent years. Project participants include the University of Cincinnati, Raytheon, Faurecia, ITI International TechneGroup (a small company based in Milford, Ohio), and TechSolve (a manufacturing consultant headquartered in Cincinnati).



WORKFORCE DEVELOPMENT PROJECT HIGHLIGHTS

Digital Manufacturing and Design 101

There are many audiences that can benefit from an introductory course in digital manufacturing: Students determining their career interests, manufacturing workers looking to move into new areas, and management of small manufacturers looking to keep current on trends, among others. DMDII partnered with Coursera, the largest provider of online courses, and the University at Buffalo, to develop a **Digital Manufacturing and Design Technology Specialization** and make it available to anyone with an internet connection. More than 30,000 unique users have accessed the course over the year that it has been online.

Mapping the Manufacturing Jobs of the Future

With new technology, the skills needed by the manufacturing workforce shifts. The only way to stay competitive both as an individual worker and as a company is to adapt to these changes. DMDII



worked with ManpowerGroup, one of the largest staffing and workforce solutions firms in the world, to identify **165 job roles** that will be a part of the transitional and future manufacturing economy. The report categorizes the information in various ways, such as identifying more than 60 roles that are good candidates for moving from a traditional role into a digital one because the training and development required would take two years or less. It also makes recommendations on the immediate steps that workers, manufacturers, educators, and policymakers should take to stay competitive in this changing landscape. DMDII partners and stakeholders are now about to use this information in their workforce planning, including Dow Chemical Company (Dow), which referenced the profiles to find the right skills and expertise in Cyber Security and Digital Thread roles for its new Digital Operations Center.

WORKSHOPS

City Tech hosted expert workshops in smart mobility and urban logistics, launching follow-on projects like the pilot with CTA and Mastercard. In addition, it hosted Mayor Emanuel's Urban Waterways Forum, a workshop for the Chicago Council on Global Affairs' Urban Forum, and the Cities Climate Forum in collaboration with the North American Climate Summit.

DMDII hosted workshops in topics that represent the changing state of manufacturing, including augmented reality, blockchain, cybersecurity, and connected supply chain. It also hosted its first "Digital Disruption Workshop," which provided a hands-on learning experience for 170 small and medium manufacturers looking to begin their digital journey. 81% of survey respondents stated that the Digital Disruption Workshop will change or shape their digital journey.





MANUFACTURING FLOOR

In June, McKinsey & Company and DMDII announced the launch of the North American Digital Capability Center (DCC) – a digital manufacturing learning center offering company leaders and their workforces hands-on experience and workshops in next-generation technology to help them advance their operations, design and productivity. The DCC is digitally connected to four additional McKinsey DCCs in Singapore, Aachen (Germany), Beijing (China), and Venice (Italy).

In addition, DMDII partners Siemens and Stanley Black & Decker expanded their use of the manufacturing floor through a Siemens Digital Enterprise Center and DMDII's Future Factory, which uses a Stanley Black & Decker impact driver to demonstrate the integration of digital technologies into a principally manual manufacturing line.

PARTNERS

Mastercard and HERE Technologies joined City Tech as Tier 1 industry partners. The MacArthur Foundation, the Sprague Institute, Chicago Community Trust, the Knight Foundation, and the McCormick Foundation have all become strategic funding partners of City Tech.

Stanley Black & Decker, Autodesk, and Duracell joined DMDII as top tier partners.



Collaborations

City Digital and Smart Chicago Collaborative combined forces to become City Tech

Collaborative in December. Bringing together City Digital and the Smart Chicago Collaborative will help ensure that technology solutions intended to improve the city reflect the perspectives and needs of Chicago's diverse residents.

City Digital was launched in 2015 to leverage Chicago's commitment to bring essential services and infrastructure into the modern era. Smart Chicago was formed in 2010 to increase people's access to the Internet and digital tools.

Combining the assets and missions of these organizations, City Tech transforms cities into testbeds for new ideas. City Tech remakes essential city services and infrastructure using advanced technology, and then expands these solutions to other cities.

UI LABS also collaborated with a wide range of stakeholders on events throughout the year:

- A Manufacturing Day event with area students
- The first Fourth Revolution Awards in partnership with mHUB and IMEC, which will become an annual event
- Many additional events with organizations including the Chicago Council on Global Affairs, Tech Stars IoT, the Manufacturing Leadership Council, BuiltWorlds, and the Illinois Technology Association
- UI LABS also became part of a network of discounted co-working spaces in Chicago

Our Team

UI LABS had two additions to its senior leadership team, adding experience across both our city infrastructure and manufacturing labs.



Brenna Berman joined as Executive Director of City Tech in May. Prior to joining UI LABS, Brenna served in Chicago Mayor Rahm Emanuel's administration, most recently as the Chief Information Officer for the City and Commissioner for the Department of Innovation & Technology (DoIT). In that time, she focused on transforming the team at DoIT to provide the skills and expertise to implement the Mayor's vision of data-driven resident services and of a more efficient, effective, and innovative City government.

Prior to joining the Emanuel Administration, Brenna built a career promoting government innovation over 10 years at IBM, where she worked closely with government agencies in cities and countries across the world to leverage technology and analytics to improve the services they provide to their residents.

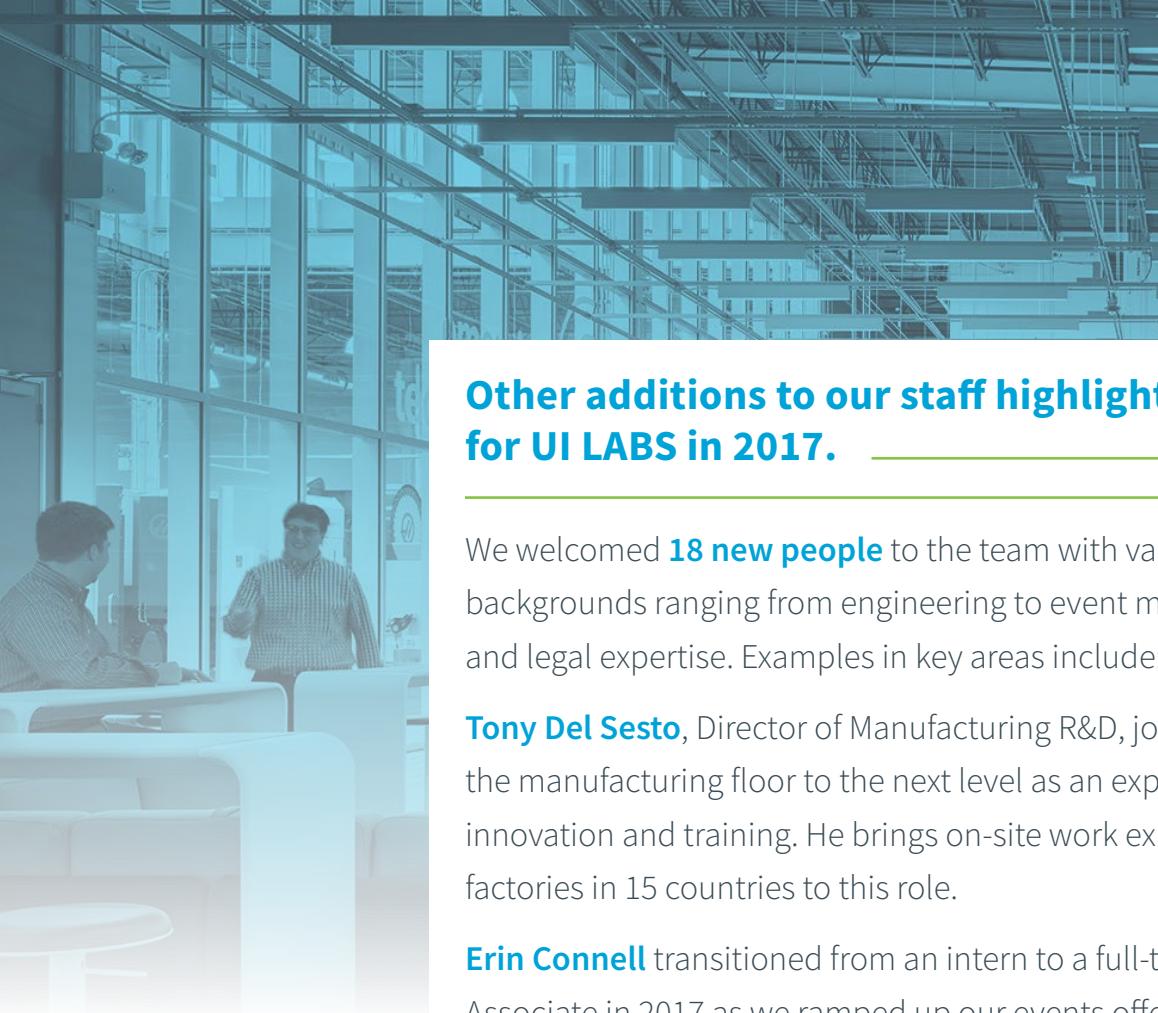
Brenna earned her bachelor's degree and Masters in Public Policy from the University of Chicago.



Kevin McDunn also joined UI LABS as its first Chief Technology Officer. In this role, Kevin McDunn develops and promotes a technology vision and roadmap to maximize the value of the UI LABS project portfolio.

Most recently Kevin was Global Head of Software, Services, and Experiences Product Management at Motorola Mobility, a Lenovo Company. He delivered experiences, software, and cloud services for Lenovo's global smartphone and wearable portfolio. In this role, he managed teams in the U.S., China, Brazil, and India to develop experiences that respond to the user in context.

Kevin has an International Masters in Management from Lancaster University (U.K.) and a B.S. in Mechanical Engineering from the University of Illinois. He is a Certified Scrum Product Owner and an accomplished inventor, holding 18 U.S. patents with 5 pending.



Other additions to our staff highlight areas of growth for UI LABS in 2017.

We welcomed **18 new people** to the team with various professional backgrounds ranging from engineering to event management to business and legal expertise. Examples in key areas include:

Tony Del Sesto, Director of Manufacturing R&D, joined the team to take the manufacturing floor to the next level as an experiential testbed for innovation and training. He brings on-site work experience in over 200 factories in 15 countries to this role.

Erin Connell transitioned from an intern to a full-time Corporate Events Associate in 2017 as we ramped up our events offerings for partners and stakeholders. In addition to work and school, Erin volunteers in meeting professionals and sustainability organizations.

Denise Linn Riedl manages ecosystem development for City Tech, tackling local technology planning, equity, and public engagement challenges that have national interest. Denise joined the City Tech team as part of the merger with Smart Chicago Collaborative. She is currently a Fellow with the Benton Foundation.

Charlie Tokowitz is a Project Innovation Engineer for DMDII, working with industry and academic partners to guide and bring focus to their collaborative research. As a member of the Project Team, Charlie shares responsibility for managing the progress of the Institute's technical and strategic initiatives.

Colleen Garlington, Director of Business Operations and Assistant General Counsel, is responsible for a range of functions including legal, contracts, compliance, facilities, human resources, and IT. Colleen has a background in commercial and intellectual property litigation as well as environmental health and safety.

For the full list of UI LABS team and their bios, [visit uilabs.org/people](http://uilabs.org/people).

Recognition

- City Digital named winner of Blackstone Inclusive Entrepreneurship Challenge
- City Digital awarded grant through EDA's Regional Innovation Strategies program
- UI LABS – Innovator of the Year, Corporate Category / Executives' Club
- Caralynn Collens – Women of M2M / Connected World
- Brenna Berman – 50 on Fire / Chicago Inno

By the Numbers



320 UI LABS partners across industry, academic, and civic sectors



450 meetings and events at the UI LABS Innovation Center, with about 12,000 visitors throughout the year



60+ DMDII projects underway or completed, involving 163 unique organizations and an investment of approximately \$95 million



5 DMDII Workshops, 7 City Tech Workshops



City Tech traveled to **Qatar**, **London**, and **Barcelona** to discuss emerging civic technologies



City Tech collaborated with representatives from 19 global cities via webinar



17 City Tech Products and Initiatives underway



Stay tuned...

2018 is already off to an exciting start. DMDII unveiled a [2018 Strategic Investment Plan](#) that describes how we will operationalize our vision of helping U.S. manufacturers make every part better than the last. We've [opened the factory floor](#) to manufacturers and academic institutions needing to quickly test process improvements without shutting down their own manufacturing lines. The U.S. Department of Defense announced investment in the launch of a [Cyber Hub for Manufacturing](#) at DMDII. City Tech joined six other organizations to announce the creation of a [shared database](#) to support criminal justice advocacy and reporting in Cook County.

Workshops in Q1 covered topics including the “Internet of Trash,” augmented reality, digitizing continuous/batch manufacturing, and “Moving Manufacturing Left.” Visit uilabs.org/events to keep up with the many workshops and events planned for the rest of the year, or to learn more about hosting your organization’s event at the UI LABS Innovation Center.

Whether you become a [partner](#), host or attend an [event](#), engage with us on social media, or simply sign up for our quarterly [newsletter](#), we hope you’ll join us to drive the digital future of industries.



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